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## Characterization of hydrogen storage materials

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Hydrogen can be stored reversibly, safely and with high hydrogen densities in light metal hydrides. Because of their sensitivity to hydrogen, neutrons are the ideal probe for characterizing metal hydride materials and tank systems. Neutron imaging was used to study hydrogenation processes in metal hydride powders. In addition, neutron and X-ray scattering methods have been used to study phase transformations and changes in nanostructure in various hydrogen storage systems to gain deeper insight into the complex hydrogen sorption processes. A high-pressure cell for in situ neutron studies was developed to characterize processes at high pressures and temperatures. The results will enable the optimization of hydrogen storage systems in terms of capacity, kinetics and safety.

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